

WHAT IS CLAIMED IS:

- 1 1. A method for loading a solute into an erythrocytic cell, comprising:
2 disposing an erythrocytic cell in a solution having a solute
3 concentration of sufficient magnitude to produce hyperosmotic pressure on the cell, thereby
4 transferring a solute from the solution into the cell.
- 1 2. The method of claim 1 wherein said solute is present in said solution in
2 a concentration of between 700 and 1000 mM.
- 1 3. The method of claim 1, wherein said solute is a disaccharide.
- 1 4. The method of claim 3, wherein said disaccharide is trehalose.
- 1 5. The method of claim 1, wherein said solution further comprises a
2 potassium salt.
- 1 6. The method of claim 5, wherein said potassium salt is potassium
2 phosphate.
- 1 7. The method of claim 1, wherein said solution further comprises α -
2 crystallin.
- 1 8. The method of claim 1, wherein said solution further comprises a
2 strong reducing agent.
- 1 9. The method of claim 8, wherein said strong reducing agent is ascorbic
2 acid.
- 1 10. The method of claim 1, wherein said solution comprises a
2 disaccharide, α -crystallin, ascorbic acid, and a potassium salt.
- 1 11. A method of claim 1, further wherein the loading is conducted at a
2 temperature of between 25 and 40° C.
- 1 12. A method of claim 11, further wherein the loading is conducted at a
2 temperature of between 30 and 40° C.

1 13. A method of claim 11, further wherein the loading is conducted at a
2 temperature of about 37° C.

1 14. An erythrocyte loaded with from 10 mM to 50 mM trehalose.

1 15. An erythrocyte of claim 11, further comprising ascorbic acid.

1 16. An erythrocyte of claim 11, further comprising α -crystallin.

1 17. A method for separating fragile or damaged cells from a population of
2 erythrocytes, said method comprising

3 contacting said population with a first solution which is hyperosmotic with
4 respect to a solute,

5 loading a solute into said erythrocytes,

6 removing said erythrocytes from said hyperosmotic solution,

7 contacting said erythrocytes with a second solution which is mildly
8 hypoosmotic in comparison to said hyperosmotic solution, thereby lysing fragile or damaged
9 cells, and

10 separating said fragile or damaged cells from said population.

1 18. A method of claim 14, wherein said separation is by centrifugation.

1 19. A method for freeze-drying erythrocytes comprising lowering the
2 hematocrit of said erythrocytes to between 2 and 5%.

1 20. A method for freeze-drying erythrocytes, comprising drying said
2 erythrocytes in the presence of liposomes.

1 21. A method of claim 18, wherein said liposomes are composed primarily
2 of unsaturated lipids.

1 22. A method for freeze-drying erythrocytes, comprising freeze-drying
2 said erythrocytes in the presence of 200-300 mOsm of potassium salts.

1 23. A method of claim 19, wherein said erythrocytes are present in a
2 hematocrit of up to 15%.

1 24. A buffer for drying erythrocytes, said buffer comprising liposomes.

- 1 25. A buffer of claim 21, wherein said liposomes are composed primarily
2 of unsaturated lipids.
- 1 26. A buffer for drying erythrocytes, said buffer comprising ascorbic acid.
- 1 27. A buffer for rehydrating dried erythrocytes, said buffer comprising
2 methylene blue.
- 1 28. A buffer for rehydrating dried erythrocytes, said buffer comprising
2 transition metal ions.
- 1 29. A buffer of claim 24, wherein said transition metal ions are selected
2 from the group consisting of zinc, copper, magnesium, and nickel.
- 1 30. A solution for rehydrating dried erythrocytes, said solution comprising
2 ascorbic acid.
- 1 31. A solution for rehydrating dried erythrocytes, said solution comprising
2 methylene blue, ascorbic acid, and transition metal ions.
- 1 32. A method for rehydrating dried erythrocytes, said method comprising
2 contacting said dried erythrocytes with a solution comprising methylene blue.
- 1 33. A method for rehydrating dried erythrocytes, said method comprising
2 contacting said dried erythrocytes with a solution comprising transition metal ions.
- 1 34. A method for rehydrating dried erythrocytes, said method comprising
2 contacting said dried erythrocytes with a solution comprising ascorbic acid.
- 1 35. A method for rehydrating dried erythrocytes, said method comprising
2 contacting said dried erythrocytes with a solution comprising methylene blue, and transition
3 metal ions.